WHAT IS CLAIMED IS:

1. An image encoding apparatus comprising:

image input means for inputting an image signal;

band dividing means for dividing the image signal input by said image input means into different spatial frequency bands;

region-of-interest extraction means for extracting a region of interest by obtaining a distribution of motion vectors in the image signal based upon values of spatial frequency components of the image signal obtained by said band dividing means;

quantization means for applying quantization processing to the region of interest extracted by said region-of-interest extraction means and different quantization processing to other regions, and outputting a quantized image signal; and

image encoding means for encoding the quantized image signal quantized by said quantization means.

2. The apparatus according to claim 1, wherein said band dividing means divides the image signal into different spatial frequency bands by applying a discrete wavelet transform to the image signal.

3. The apparatus according to claim 1, wherein said region-of-interest extraction means includes motion-

vector estimation means for estimating motion vectors within the image signal using a portion of low-frequency components which changes with time and high-frequency components of the image signal obtained by said band dividing means,

wherein the region of interest in the image signal being is extracted by said region-of-interest extraction means based upon the distribution of motion vectors estimated by said motion-vector estimation means.

4. The apparatus according to claim 3, wherein said image input means inputs an image signal captured in accordance with a picture-taking mode; and

when said region-of-interest extraction means extracts a region of interest in the input image based upon the distribution of motion vectors, a region judged to be the region of interest is changed over in accordance with the picture-taking mode of said image input means.

5. The apparatus according to claim 1, wherein said region-of-interest extraction means includes calculation means for calculating degree of left-right symmetry of the image signal using high-frequency components of the image signal obtained by said band dividing means,

wherein the region of interest in the input image

being is extracted by said region-of-interest extraction means based upon a distribution of degrees of left-right symmetry calculated by said calculation means.

6. The apparatus according to claim 1, wherein said image input means inputs an image signal captured in accordance with a picture-taking mode; and

on the basis of the distribution of degrees of left-right symmetry, said region-of-interest extraction means changes over extraction processing of the region of interest in the image signal in accordance with the picture-taking mode of said image input means.

7. The apparatus according to claim 1, wherein said region-of-interest extraction means segments the image signal into a plurality of regions using low-frequency components of the image signal obtained by said band dividing means, and decides boundaries of these plurality of regions using high-frequency components of the image signal obtained by said band dividing means.

8. An image encoding apparatus comprising:

transformation means for applying a discrete wavelet transform to an image signal;

motion detection means for detecting motion of an image based upon the image signal;

region designation means for designating a region of the image signal based upon information indicating motion of the image detected by said motion detection means;

quantization means for quantizing a discrete wavelet transformed output from said transformation means in accordance with the region designated by said region designation means and outputting a quantized image signal; and

encoding means for encoding the quantized image signal quantized by said quantization means.

9. The apparatus according to claim 8, wherein said motion detection means detects motion of the image in accordance with a difference between pixel values of two mutually adjacent pixels vertically of the image signal.

10. The apparatus according to claim 8, wherein said motion detection means detects motion of the image in accordance with a difference between pixel values of corresponding pixels in two successive frames of the image signal.

11. The apparatus according to claim 8, wherein said motion detection means includes:

block calculation means for forming the image

signal into blocks and calculating motion vectors on a block-by-block basis; and

detection means for detecting motion of the image based upon whether magnitude of a motion vector calculated by said block calculation means is greater than a predetermined value.

12. The apparatus according to claim 8, wherein said quantization means performs quantization upon raising quantization precision of the image region designated by said region designation means.

13. The apparatus according to claim 8, wherein said region designation means designates a region of the image signal based upon the information indicating motion of the image output by said motion detection means.

14. The apparatus according to claim 8, wherein said region designation means designates a region of the image signal not contained in the information indicating motion of the image output by said motion detection means.

15. The apparatus according to claim 8, wherein said region designation means includes:

counting means for counting number of pixels based upon the information indicating motion of the image detected by said motion detection means; and selection means for selecting a method of designating an area of the image signal that is based upon the information indicating motion of the image detected by said motion detection means, based upon the number of pixels counted by said counting means.

16. The apparatus according to claim 8, wherein said encoding means decomposes a data sequence, which is supplied from said quantization means, into bit planes, applies binary arithmetic encoding on a per-bit-plane basis and outputs code sequences giving priority to code sequences that correspond to bit planes of higher order bits.

17. An image encoding method comprising:

an image input step of inputting an image signal;

a band dividing step of dividing the image signal input at said image input step into different spatial frequency bands;

a region-of-interest extraction step of extracting a region of interest by obtaining a distribution of motion vectors in the image signal based upon values of spatial frequency components of the image signal

obtained at said band dividing step;

a quantization step of applying quantization processing to the region of interest extracted at said region-of-interest extraction step and different quantization processing to other regions and outputting a quantized image signal; and

an image encoding step of encoding the quantized image signal.

18. The method according to claim 17, wherein said band dividing step divides the image signal into different spatial frequency bands by applying a discrete wavelet transform to the image signal.

19. The method according to claim 17, wherein said region-of-interest extraction step includes steps of:

estimating motion vectors within the image signal using a portion of low-frequency components which changes with time and high-frequency components of the image signal obtained at said band dividing step; and

extracting a region of interest in the image signal based upon the distribution of motion vectors estimated.

20. The method according to claim 19, wherein said image input step inputs an image signal captured in accordance with a picture-taking mode; and

when said region-of-interest extraction step extracts a region of interest in the image signal based upon the distribution of motion vectors, a region judged to be the region of interest is changed over in accordance with the picture-taking mode.

21. The method according to claim 17, wherein said region-of-interest extraction step includes:

a calculation step of calculating degree of left-right symmetry of the image signal using high-frequency components of the image signal obtained at said band dividing step;

a step of extracting a region of interest in the image signal based upon a distribution of degrees of left-right symmetry calculated at said calculation step.

22. The method according to claim 17, wherein said image input step inputs an image signal captured in accordance with a picture-taking mode; and

on the basis of the distribution of degrees of left-right symmetry, said region-of-interest extraction step changes over extraction processing of the region of interest in the image signal in accordance with the picture-taking mode.

23. The method according to claim 17, wherein said

region-of-interest extraction step includes steps of segmenting the image signal into a plurality of regions using low-frequency components of the image signal obtained at said band dividing step, and deciding boundaries of these plurality of regions using high-frequency components of the image signal.

24. An image encoding method for encoding an image signal, comprising:

a transformation step of applying a discrete wavelet transform to the image signal;

a motion detection step of detecting motion of an image based upon the image signal;

a region designation step of designating a region of the image signal based upon information indicating motion of the image detected at said motion detection step;

a quantization step of quantizing a transformed image signal output from said transformation step in accordance with the region designated at said region designation step and outputting a quantized image signal; and

an encoding step of encoding the quantized image signal quantized at said quantization step.

25. The method according to claim 24, wherein said

motion detection step detects motion of the image in accordance with a difference between pixel values of two mutually adjacent pixels vertically of the image signal.

26. The method according to claim 24, wherein said motion detection step detects motion of the image in accordance with a difference between pixel values of corresponding pixels in two successive frames of the image signal.

27. The method according to claim 24, wherein said motion detection step includes:

a block calculation step of forming the image signal into blocks and calculating motion vectors on a block-by-block basis; and

a detection step of detecting motion of the image based upon whether magnitude of a motion vector calculated at said block calculation step is greater than a predetermined value.

28. The method according to claim 24, wherein said quantization step performs quantization upon raising quantization precision of the image region designated at said region designation step.

29. The method according to claim 24, wherein said

region designation step designates a region of the image signal based upon the information indicating motion of the image output at said motion detection step.

30. The method according to claim 24, wherein said region designation step designates a region of the image signal not contained in the information indicating motion of the image output at said motion detection step.

31. The method according to claim 24, wherein said region designation step includes:

a counting step of counting number of pixels based upon the information indicating motion of the image detected at said motion detection step; and

a selection step of selecting a method of designating an area of the image signal that is based upon the information indicating motion of the image detected at said motion detection step, based upon the number of pixels counted at said counting step.

32. The method according to claim 24, wherein said encoding step decomposes a data sequence, which is supplied by said quantization step, into bit planes, applies binary arithmetic encoding on a per-bit-plane basis and outputs code sequences giving priority to code

sequences that correspond to bit planes of higher order bits.

33. A computer-readable storage medium storing a program for implementing an image encoding method for encoding an image signal, comprising:

a module of a band dividing step of dividing an image signal into different spatial frequency bands;

a module of a region-of-interest extraction step of extracting a region of interest by obtaining a distribution of motion vectors in the image signal based upon values of spatial frequency components of the image signal obtained by the module of said band dividing step;

a module of a quantization step of applying quantization processing to the region of interest extracted by the module of said region-of-interest extraction step and different quantization processing to other regions; and

a module of an image encoding step of encoding the image signal that has been quantized by the module of said quantization step.

34. A computer-readable storage medium storing a program for implementing an image encoding method for encoding an input image signal, comprising:

a module of a transformation step of applying a discrete wavelet transform to the image signal;

a module of a motion detection step of detecting motion of an image based upon the image signal;

a module of a region designation step of designating a region of the image signal based upon information indicating motion of the image detected by the module of said motion detection step;

a module of a quantization step of quantizing a transformed output by the module of said transformation step in accordance with the region designated by the module said region designation step and outputting a quantized image signal; and

a module of an encoding step of encoding the quantized image signal quantized by the module of said quantization step.